Sherburne NWR - Narrative Report -
1970

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Sherburne MONTHS OF September 9 TO November 4, 1970

(1) Species	(2) Weeks of reporting period: Sept 9-11	Sept 10-12	Sept 23-13	Sept 30-14	Oct 7-15	Oct 14-16	Oct 21-17	Oct 28-18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimat total
Swans:											
Whistling							20				
Trumpeter											
Geese:											
Canada					57	35	50	30			
Cackling											
Brant											
White-fronted											
Snow						75	20				
Blue											
Other											
Ducks:											
Mallard	328	400	500	650	948	3200	2340	1000			
Black											
Gadwall							20				
Baldpate	16		100		1380		70				
Pintail	7			50	102	80	60				
Green-winged teal	17	200	300	200	408						
Blue-winged teal	1136	2500	3000	2000	1440	100					
Cinnamon teal											
Shoveler	5										
Wood	355	200	150	75	87	25	5	5			
Redhead											
Ring-necked		50	90	175	197	300	480	20			
Canvasback					6						
Scaup							10				
Goldeneye											
Bufflehead											
Ruddy					10						
Other	30										
Coot:	156	1000	20,000	20,000	25,000	15,000	5000	1000			

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese			
Ducks			
Coots			

SUMMARY

Principal feeding areas _____

Principal nesting areas _____

Reported by _____

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Sherburne MONTHS OF November TO December 31, 1970

(1) Species	(2) Weeks of reporting period: Nov 4 11	Nov 11 12	Nov 25 13	Dec 2 14	Dec 9 15	Dec 16 16	Dec 23 17	Dec 31 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling		25							59		
Trumpeter											
Geese:											
Canada	40	40	40						2044		
Cackling											
Brant											
White-fronted											
Snow									117		
Blue											
Other											
Ducks:											
Mallard	500	200							68,366		
Black	2								14		
Gadwall									140		
Baldpate									10,850		
Pintail									1,484		
Green-winged teal									6,356		
Blue-winged teal									62,580		
Cinnamon teal											
Shoveler											
Wood	5								3,830		
Redhead									70		
Ring-necked	10								9,240		
Canvasback									42		
Scaup									70		
Goldeneye											
Bufflehead											
Ruddy									70		
Other											
Coot:	200	50							610,750		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	61	20	
Geese	2,150	50	
Ducks	438,274	7,220	
Coots	611,005	25,000	

SUMMARY

Principal feeding areas Orrock Lake, Rice Lake, Johnson & Durgin Slough

Principal nesting areas Marsh borders along county road # 5, Turnbull slough, Orrock Lake

Reported by Robert L. Drieklein

Assistant Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Sherburne Months of January 1 to December 31 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon	2	4-18	5	6-20	1	8-26		1	2	5
Red-necked grebe	2	5-25	4	5-25	1	7-29		1	2	4
*Eared grebe	50	4-17	100	4-20	1	5-2				150
Horned grebe	1	4-20	10	4-20	1	4-20				50
Pied-billed grebe	1	4-14	100	6-25	1	10-29		U	U	100
Great blue heron	4	3-31	50	7-10	1	10-6		U	U	60
American bittern	1	5-9	75	5-20	1	9-5		U	U	75
Green heron	1	4-14	125	7-5	1	9-16		U	U	150
Least bittern	2	7-13	4	7-16	1	7-28		U	U	10
Common egret	1	4-14	4	5-1	1	9-2				10
Black-crowned night heron	4	4-24	25	5-10	25	5-10				30
Sandhill crane	1	5-1	2							2
Sora	2	4-25	1500	6-10	2	9-24		U	U	
*Virginia Rail	2	4-25	500	5-10	1	7-10		U	U	500
II. Shorebirds, Gulls and Terns:										
American woodcock	1	4-20	500	5-1	1	10-28				500
Common snipe	15	4-14	1500	4-25	1	10-28				1500
Greater Yellowlegs	10	4-26	150	5-10	1	9-27				200
Lesser yellowlegs	4	4-23	75	5-10	1	9-27				150
*Dowitcher	2	5-2	5	5-2	2	5-2				10
Spotted sandpiper	1	6-15	50	7-10	1	7-10				50
Wilson's phalarope	2	4-26	10	5-3	2	5-26				20
Herring gull	6	4-14	20	5-2	1	10-2				25
Ring-billed gull	1	4-20	20	5-2	1	10-2				30
Common tern	14	4-20	75	5-20	75	5-20				100
Black tern	20	5-22	200	5-25	20	8-25				500
Killdeer	1	4-6	300	7-10	1	9-23				600

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	2	1-15	1500	7-15	1	10-29			
White-winged dove									
Loggerhead shrike	1	4-14	50	4-20	1	11-19			
IV. Predaceous Birds:									
Golden eagle	1	3-21	2	11-10	2	11-10			
Duck hawk									
Horned owl	Resident		50	6-1					
Magpie									
Raven									
Crow	Resident		150	6-1					
Turkey vulture	6	4-11	10	4-15	10	4-15			
Red-tailed hawk	4	4-2	50	4-10					
Red-shouldered hawk	1	4-14	25	4-20	1	7-1			
Rough-legged hawk	2	4-4	20	4-10	1	11-25			
Coopers hawk	2	8-1	7	8-15	1	11-21			
Sharp-shinned hawk	3	9-1	12	9-15	1	10-6			
Sparrow hawk	1	4-13	75	4-20	1	10-15			
Gyrfalcon(dark phase)	1	10-5	1	10-5	1	10-5			

Reported by Robert L. Drieslein

*First record of this species for the Sherburne NWR.

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Sherburne Months of September 1 to December 31, 1970

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ruffed grouse	Upland, bottomland timber, scrub & swamp 9,115 acres	10			50:50	500	-	-	1400	
Ring-necked pheasant	Grassland, reverting agricultural land, marshes & fields 8,280 acres	336			50:50					

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Sherburne Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Roadkills Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed deer	Cropland 5,822 Upland 14,787 Marsh 9,797	U	20				2	U	U			250	200	U

Remarks:

Reported by Robert L. Drieslein, Ass't Ref. Mgr.

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5
60701

DISEASE

Refuge Sherburne Year 1970

Botulism None this year

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease None

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

-1757
orm NR-7
Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge **Sherburne** Year 19**70**

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
Blue gramma	80 lb.	R	4-70	Commercial	100	50	12 areas, S&W portions of Refuge	Mixture 7 lb./A	106		May-June	Good	
Big bluestem	50 lb.	R	4-70		77	200							
Green needle-grass	90 lb.	R	4-70		60	30							
Switchgrass	240 lb.	R	4-70		87	150							
Indiangrass	120 lb.	R	4-70		125	100							
Little blue-stem	-	-	-	-	-	150	-	-			-	-	

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

otal acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Sherburne County Sherburne State Minnesota

Cultivated Crops Grown	Permittee's Share Harvested 1a Acres	Permittee's Share Harvested Bu./Tons	Government's Share or Return Harvested Acres	Harvested Bu./Tons	Unharvested 2 3 Acres	Unharvested Bu./Tons	Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
Corn	579	23,000	7	300	148	5,600	724	COVER	
Rye(harvested)	316	5,400					316	sweet clover	37
Rye(seeded)					285	285 T	285	native grass mixture	106
Red or Alsike clover					224	100 T	224	Browse	
Dwarf milo	5.5	170			.5	20	6	Rye	285
Silage sorgum	20	60T					20	Alfalfa	36
Alfalfa	920.5				36	18 T	36		
Japenese millet					70	2800	70		
Proso millet			2	60	8	240	10		
Foxtail millet			2	40	8	200	10		
Buckwheat			11		10	300	10		
					789.5		1711		
								Fallow Ag. Land	35

No. of Permittees: Agricultural Operations 11 Haying Operations 7 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue
Alfalfa	150	77	$77.00
Red clover	75	55	-
Hay - Wild			

GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
1. Cattle	6-intermittent		$10	4
2. Other				

1. Total Refuge Acreage Under Cultivation	1,711
2. Acreage Cultivated as Service Operation	144

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Sherburne Months of January through December, 19X-70

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Yellow corn	700	300	1000			500	500	500		500	
Japanese millet		50	50		50		50	-			
Proso millet		65	65		5	10	15	50		50	
Foxtail millet	5	40	45		5	10	15	30		30	
Buckwheat		10	10		10		10	-			
Elbon rye		25	25		25		25	-			
Sweet clover		3	3		3		3	-			
Mammoth red clover		1	1		1		1	-			

(8) Indicate shipping or collection points Princeton, Minnesota

(9) Grain is stored at Refuge granary

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DEP. SEC., WASH., D.C. 17065

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge Sherburne NWR Year 19X70

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Nan Conifer Co.	1	McNamara Tract(28)	35	3064 NorwayPine 3046 Scotch Pine	20¢/tree 35¢/tree	612.80 1066.10	cutting to take place thru 1970, clear cut Scotch pine & leave 100 Norway pine per acre,	Norway Pine Scotch Pine Xmas trees
Nelson's Tree Farms	2	Pergerson (43) Olaffson (179) Berlin(22) Berlin(266) Mason(259)	152	816 trees	25¢/tree	206.50	Same as above	Norway Pine Scotch Pine Xmas trees
Leonard Latterell	16	Tekar(159a)	27	965 Spruce		1750.00	cutting to be completed by 1971.	Blue, Black & White Spruce
	17	Skoog(71)		630 NorwayPine		800.00		Norway Pine

Total acreage cut over 214 Total income $4,435.40

No. of units removed B. F. Method of slash disposal

Cords

Ties 8,521 Christmas Trees

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Sherburne NWR

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May-June	Quack Grass	All Farm Units	700	AAtrex	700 lb.	1 lb./Acre	Water 25 gal/ Acre	Tractor sprayer
July	Leafy Spurge Canada Thistle	8 small areas	6	Picloram	12 lb.	.5 lb/Acre	Beads	Broadcast

10. Summary of results (continue on reverse side, if necessary)

AAtrex is supplied by cooperative farmers as part of contract agreement. Treatment does not eliminate quack grass, but gives adequate control for corn production.

Picloram appears to give excellent control of both spurge and thistle.

35500

NARRATIVE REPORT

for

1970

SHERBURNE NATIONAL WILDLIFE REFUGE

Princeton, Minnesota

1970 PERSONNEL ROSTER

SHERBURNE NATIONAL WILDLIFE REFUGE

Permanent Personnel

Robert G. Yoder, Refuge Manager, GS-12	1/1/70 to 12/30/70
E. Homer McCollum, Soil Conservationist, GS-9	1/1/70 to 12/30/70
Robert L. Drieslein, Ass't. Refuge Mgr., GS-7	6/22/70 to 12/30/70
Patricia A. Dunham, Clerk-Typist, GS-4	1/1/70 to 12/30/70
Wesley C. Thompson, Maintenanceman, WG-9	1/1/70 to 12/30/70
Reuben A. Mathison, Maintenanceman, WG-5	1/1/70 to 12/30/70
Henry W. Trebesch, Maintenanceman, WG-5	1/1/70 to 12/30/70

Temporary Personnel

Merlin A. Wicktor, Operator General, WG-6	1/1/70 to 12/30/70
James D. Thompson, Laborer, WG-2	1/1/70 to 1/10/70
Milton C. Elveru, Laborer, WG-2	3/23/70 to 10/3/70
Gordon W. Wold, Laborer, WG-2	4/13/70 to 10/3/70
Orville Johnson, Laborer, WG-2	4/13/70 to 9/5/70
Wayne Harper, Laborer, Intermittent, WG-2	4/20/70 to 8/21/70
Ann Pasch, Laborer, Intermittent, WG-2	4/20/70 to 8/8/70
Raleigh Blouch, Cons. Aid, WG-2	6/1/70 to 10/3/70
John Scaife, Cons. Aid, WG-2	6/8/70 to 9/5/70

C O N T E N T S

SHERBURNE NATIONAL WILDLIFE REFUGE

Princeton, Minnesota

NARRATIVE REPORT

Calendar Year 1970

I. General

A. Weather Conditions - 1970

TABLE I

	Precipitation			Temperature	
	Snowfall*	This Month**	Normal***	Maximum**	Minimum**
January	2.7"	.64	.90	35	-36
February	2.8"	.39	.90	43	-28
March	6.1"	1.80	1.50	45	-1
April	2.6"	2.26	2.00	85	0
May	T	2.88	3.70	89	28
June	0	4.33	4.50	92	41
July	0	4.07	3.30	95	45
August	0	2.35	3.70	93	41
September	0	1.83	2.40	89	29
October	0.4"	5.87	2.00	83	13
November	9.6"	3.36	1.50	54	-5
December	2.5"	.25	.80	46	-12
Annual Totals:	26.7"	30.03	27.20	Extremes: 95	-36

*Data obtained from U.S. Weather Bureau office in St. Cloud, Minnesota.

**Data obtained from official weather station maintained by Gordon Wold of rural Santiago, ½ mile north of the Refuge.

***Data obtained from Milaca, Minnesota weather station located 15 miles north of the Refuge.

Although the weather statistics show the precipitation for each month to be about normal, in actuality it was a fairly dry year.

Snowfall was light after the first of the year and very cold through January and February. By the 10th of March the temperature had climbed to above freezing every day until the end of April when we had a high of 85°. The summer continued hot and dry. The precipitation averaged near normal but the pattern was not. Long stretches with little or no rain (almost 30 days in one case) would be followed by several days of steady downpour. A heavy rain of over 4 inches occurred from September 7-12 preceded by 21 days of little or no rain and followed by 12 days of the same.

October, November and December have been mild with snowfall extremely light.. As we go into 1971 there is less than 2" of snow on the ground. This compares with the last couple of years when we have had over two feet by this time.

B. Habitat Conditions

1. Water Spring runoff was slow and easy, due to alternate freezing and thawing weather. Rains shortly after snow melt, brought the river up to slightly over bank full. All sloughs and potholes filled, but few freshly flooded areas were available to attract migrating waterfowl.

Water levels in natural wetlands and our few newly constructed ponds remained adequate for brood production. The water gradually diminished throughout the summer, and was quite low when fall migration started.

Late fall rains again filled depressions and raised the river to nearly bank full. However, the increased water did not bring a corresponding increase in waterfowl use.

2. Food and Cover Waterfowl nesting and brood cover appears deficient. This seems confirmed by the low production figures we show.

Newly constructed ponds with emergent grass, sedge and brush cover received heavier brood use than the natural wetlands, which are characterized by solid cattail or open water with cattail borders.

Food production appears to be more than adequate. A corn field which had been harvested, disced in early April, and seeded to red clover, was used by a small group of mallards from mid-April until early May. From 30 to 60 mourning doves used this same field until vegetation completely covered the bare spots in early June. Other than this, I have yet to see dry land grain field feeding by waterfowl on this area. We did have some goose use in October and November on green rye, on a burned sedge meadow, and on a harvested oats field, which contained green volunteer oats and foxtail.

Two acres of flooded smartweed held 2,000 mallards for about a week in early April.

Standing corn is used quite heavily by deer during the winter. The majority of the aspen on the refuge has out-grown its usefulness as deer browse. A timber management plan, now in the making, should remedy this situation.

Cover for deer, grouse and pheasant is above average for this area, primarily because of lack of heavy livestock use.

II. WILDLIFE

A. Migratory Birds

1. Swans Whistling swans were observed migrating over the Refuge during the spring and fall. One flock of 20 birds spent a day on Rice Lake and other small groups were observed for a total of 59 use days this year. This is considerably less than the 1120 swan use-days recorded for 1969. We hope that when extensive water areas are impounded in the future, substantial numbers of swans will begin using the refuge during their migration.

Apparently, 4 years is not the age of understanding for trumpeter swans as we had hoped. Our pair failed to perpetuate their numbers again this year. Maybe next year they will finally get with the program.

2. Ducks The first migrant observed was a common goldeneye on the St. Francis River behind the headquarters on April 2. Waterfowl numbers increased rapidly and by April 11 there were about 3,000 ducks using the refuge, mainly mallards, scaup and ring-necks. During the last week in April teal began moving in and duck numbers reached a peak for the year of 7200 birds. This decrease from the peak in 1969 of 12,000 can be attributed in part to less favorable water conditions at the peak of migration. The spring thaw this year was sporadic and somewhat delayed and not nearly as dramatic as in 1969.

Duck production this year was down considerably from 1969. An estimated 448 young were produced as compared to 632 in 1969. This represents a decrease of about 29%. Excessive hunting pressure on local ducks may have been a factor in the decline in numbers of broods. This is supported by the fact that mallards showed the greatest losses while blue-winged teal broods remained about the same as last year. A large percentage of the teal using the refuge in late summer leave just prior to the hunting season.

A survey of wood duck nest boxes made this summer showed that 14 of 95 boxes (14.4%) had been used by woodducks. Use of wooden boxes was 11 of 51 boxes (21.6%) as compared to 2 of 39 boxes (5.1%) for the metal types.

Teal began moving into the refuge during the latter part of August, largely in response to an excellent wild rice crop on Orrock Lake which began ripening at about this time. Relatively large numbers of woodducks were also counted on Orrock Lake during the last week in August. Duck numbers increased to a peak fall population of about 4600 the day before the opening of waterfowl season. Mallards, baldpates, pintails and teal comprised the majority of the birds present. A dramatic redistribution of birds occurred on the opening day of waterfowl season. At 10:00 A.M. there were 4 ducks observed on Long Pond, a 20-acre impoundment which is one of three closed areas on the refuge. By 3:15 P.M., 1500 ducks, mostly mallards and ring-necks had moved into Long Pond. This area held 2-3,000 birds throughout most of the hunting season until just before freeze-up on November 15, and it provided nearly all of the limited shooting after opening weekend. As in 1969, the birds soon established a "flyway" pattern between Long Pond and the rice beds on Little Rice Lake west of Princeton, Minnesota. The late "northern flight" of ducks just never materialized this year. No major flight of ducks was observed moving into the refuge after the hunting season; consequently, duck use days declined steadily until freeze-up.

3.Geese The first Canada geese seen this year were during the second week of April. Two flocks of about 40 birds each stayed with our captive flock until the last week of April. No snows or blues were recorded on the refuge this spring. The first Canada geese observed in the fall was a flock of 40 on Long Pond. Small flocks were seen on several occasions during the hunting season and one group of about 40 birds stayed with the captive flock from early October until the middle of November. Seventy-five snow and blue geese were observed on the refuge during the second week of October. Goose use-days during the year totalled 2161. On three different occasions, small flocks of Canadas were seen attempting to land but "sky-busting" changed their minds. Excessive hunting pressure and lack of extensive water areas where the birds can find sanctuary continues to be the dominant limiting factors on refuge goose use.

The following table summarizes the duck, goose and coot use days on the refuge over the past five years:

TABLE II

Year	Ducks	Geese	Coots
1966	174,670	840	104,405
1967	181,196	1,611	105,756
1968	335,181	5,684	195,510
1969	528,246	4,039	463,645
1970	438,274	2,161	611,005

A progress report on the refuge's captive Canada goose program will be discussed in Part V.

4. Other Marsh Birds American coots were first sighted during the third week in April. Their numbers reached a peak a week later and then declined to less than a dozen birds by early May. No young coots were observed during the summer months. Coots showed up again in force during early September and by September 12 there were about 20,000 on Orrock and Rice Lakes. Most of the birds took advantage of the excellent wild rice crop on Orrock Lake and refused to leave even in the face of very heavy hunting pressure in early October. The last coots this year were seen November 14 on Orrock Lake just before freeze-up. It is apparent from the above table that coot numbers have increased each year since 1965 to a point where the total coot-use days now exceeds duck and goose-use days combined. During the peak of migration this fall, coots outnumbered ducks about 5 to 1.

No great blue herons nests were seen this spring. Twenty-five to thirty birds roosted in a small oak island on the west side of Rice Lake but they have not re-established the rookery which was active on the northwest corner of the refuge in 1968. Green herons are becoming increasingly common on the refuge. Several pairs nested adjacent to Long Pond, Orrock Lake and other marsh areas. At least two pairs of least bitterns frequently were seen around Long Pond during the summer and are believed to have nested.

A pair of common loons nested on Orrock Lake this year and raised two young. An un-mated adult was seen frequently on Bergerson Slough during the summer. Loons were last seen again on August 26. A pair of red-necked grebes also nested on Orrock Lake. They hatched two young which disappeared a short time later. Eared grebes were observed this spring although none stayed around to nest. This was the first record for this species on the refuge.

Two sandhill cranes were seen this spring and a group of three birds observed on two occasions in late summer. It is not known whether sandhill cranes nested here this summer, however, two young were produced last year.

5. Dove Two-hundred and seventeen doves were trapped and banded from June 23 to August 31. In addition, 11 doves were recaptured that had previously been banded on the refuge. A red-tailed hawk became very proficient at reaching through the sides of the trap and catching the doves inside. An attempt to capture the hawk was unsuccessful but it did discourage him from returning to the trapping site. White and red proso millet proved to be the best bait particularly when the area was pre-baited for one week prior to setting the traps. Mourning doves were present on the refuge until the last week in October. One bird was observed near the headquarters incubating a single egg during the last week in September.

B. Upland Game Birds

Ring-necked pheasants showed a slight increase this year. They might even make it off the endangered species list by next year. Two pheasants broods were seen and adult birds showed up more frequently than in 1969. It is estimated that the refuge population is about 50 birds.

Ruffed grouse populations appear to be at an all time high this year. The Minnesota Conservation Department predicted dramatic increases in grouse numbers in the northwestern part of the state, and our area showed a slight improvement over last year. This has been attributed mainly to improved snow conditions for burrow roosting with an increase in winter carry-over of birds. Grouse habitat on the refuge has expanded over the past few years and we hope that our capacity can be increased. Aspen thickets are coming in along field and marsh borders which were farmed or grazed at one time. On the other hand, substantial acreages of hardwoods, mainly oak, are becoming over-mature and will require thinning to retard succession. If this is not done, our habitat losses will probably begin to exceed our gains.

C. Big Game Animals

Information on the white-tailed deer population on the refuge is not adequate to warrant any conclusions as to their status this year. According to surveys conducted by the Minnesota Conservation Department, deer populations were down in most areas of the state to the point where the hunting season was reduced from 5 days to one or two days. Their data showed that productivity of the herds has declined as a result of over-hunting and consequent depletion of breeding-age animals. At any rate fewer hunters were out this year and considerably fewer deer were killed. Those examined

appeared to be in excellent condition. If we are fortunate enough to have good snow conditions this winter at a time when the Bureau aircraft is available, we may be able to get a reliable head count of deer as a basis for estimating this years' population. We were unable to obtain any reasonable data on last years flight due to poor weather conditions. Two deer are known to have been struck by vehicles on the refuge this year, while another was crippled by a hunter and later found dead. Sixteen deer were known to have been taken by hunters so our total harvest from all causes was 19 animals.

D. Fur Animals, Predators, Rodents and other Animals

1. Muskrat These animals appear to be on the increase at Sherburne. One-hundred and seventeen muskrat houses were counted on roughly 800 acres of marsh which is a substantial increase over the past 2 years. The rain we received this year just before freeze-up should help to carry more animals over the winter although this may be offset by the heavy trapping pressure this fall. The rise in muskrat populations may assist our goose propagation efforts. We are hoping that 'rat houses will provide secure nesting sites for mated pairs of giant Canada geese to be released next spring.

2. Mink and Beaver Mink sign was seen quite often during the muskrat house count along the margins of marshes and lakes. Beavers are present on the refuge in limited numbers due to intensive trapping during the spring months. It is regrettable that spring beaver trapping continues on the refuge. With the exception of a few problem animals which could be selectively removed by qualified refuge personnel, beaver activities tend to expand what limited waterfowl habitat that we now have. In addition, their presence on the St. Francis River is of considerable esthetic importance to canoeists, fisherman and general sight-seers. Surely these values far outweigh the "sport" enjoyed by a handful of beaver trappers.

3. Raccoon, Striped Skunk and Fox These animals are all fairly common on the refuge. Both red and gray foxes are present on the refuge and their tracks are common in winter. Red foxes spend a considerable amount of time traveling around and across frozen marshes probably in search of meadow voles. It is surprising that foxes are so common in light of the scarcity of rabbits, pheasants, and other large prey at this time.

4. Rabbits Cottontails are probably increasing in numbers but an observation is still a noteworthy event. Snowshoe rabbits were seen quite frequently this year and track counts adjacent to shelterbelts and woodlots suggest that these animals are fairly common. A few white-tailed jackrabbits were seen this year, one in the clutches of a red fox.

E. Hawks, Eagles, Owls and Crows

1. Hawks The following species of hawks were seen on the Refuge this year:

Goshawk
Cooper's hawk
Sharp-shinned hawk
Red-tailed hawk
Red-shouldered hawk
Rough-legged hawk
Marsh Hawk
Sparrow hawk
Gyrfalcon

Sparrow hawks are abundant during the summer and red-tailed hawks were quite common particularly during the fall migration. Cooper's and sharp-shinned hawks were seen on several occasions during the year. Considering the secretive nature of these birds, they are probably much more numerous than we realize. On November 21 a Cooper's hawk made a pass at some house sparrows roosting on a feeder at Quarters #9. Unfortunately, he missed. On November 5 maintenanceman Wes Thompson picked up a crippled bird on the Refuge which turned out to be an immature, dark phase gyrfalcon. This species is rare in Minnesota and only a few confirmed sightings have been recorded during the past several years. The bird had sustained a broken wing from a shotgun blast and later died of its wounds. Which all goes to prove that gyrfalcons are better off taking their chances in the Arctic.

2. Eagles A total of three golden eagles were seen this year, one in February and the other two on November 11. We are hopeful that this species and the bald eagle may decide to nest here in the future.

3. Owls Great-horned owls are fairly common on the refuge considering the scarcity of rabbits at this time. One pair had the audacity to snatch a few of our goslings this spring, but we haven't yet declared war on the owls. Long-eared owls are seen occasionally. Several pairs of short-eared owls moved into the refuge about the middle of December. Thirteen were seen on the Christmas Bird Count. This is the first record for this species on the Refuge.

4. Crows Crows are permanent residents on the Refuge and are not considered to be a problem at present.

F. Other Birds

Our bird list was up-dated again this year with an additional nine species being added as follows:

1. Eared grebe
2. Red-shouldered hawk
3. Gyrfalcon
4. Long-eared owl
5. Short-eared owl
6. Red-breasted nuthatch
7. Hermit thrush
8. Black and white warbler
9. Lark sparrow

This brings the total number of bird species recorded on the Refuge to 184 since 1965.

Kingfishers were observed quite regularly this summer, particularly along wooded stretches of the St. Francis River. A few pairs nested in woodduck nesting boxes. Pileated woodpeckers were seen occasionally adjacent to stands of mature hardwoods. The refuge forest management plan will provide for ample numbers of dead and hollow trees to be left standing as potential nesting sites for these birds and other cavity nesters.

G. Fish

The northern pike continues to be the number one game fish on the Refuge. A good population of catchable-size fish occurs in the deeper pools of the St. Francis River. One specimen taken this summer weighed nine-and-a-half pounds. Carp are present throughout the St. Francis River drainage system. During high water in the spring, they gain access to nearly all marshes and lakes on the Refuge. Rice Lake is literally swarming with carp in midsummer and they are probably the dominant influence in the distribution of aquatic vegetation. Other fish species known to be present in the St. Francis River include the following:

1. Black bullhead
2. Johnny darter
3. Northern redhorse
4. Fathead minnow
5. Largemouth bass
6. White crappie
7. Bluegill
8. Rock bass
9. Mudminnow

H. Reptiles and Amphibians

Little is known about this group of animals, however, the refuge

list now includes 11 reptiles and 8 amphibians as being recorded since 1965.

I. Disease

None to report.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

The exterior of the office and one residence were painted by contract. Refuge personnel painted the interior of one residence. Deep wells were drilled at Quarters 9 and 157.

Captive goose facilities were increased by construction of a new pond and holding pen. A brooder house and gosling pen were completed at the Shop area. The water supply to the breeding pens was revamped.

Installation of a slide gate on a culvert under Co. Road 5, resulted in a shallow impoundment, which attracted both ducks and visitors. It also provided some of the best brood habitat on the area.

Approximately 300' of dike was constructed for a small impoundment in the southern part of the Refuge. Water gauges were set on all river bridges.

Fourteen miles of boundary was posted. This completes posting except for a few areas where boundary property has not been purchased, and the area south of Co. Road 4, where the final boundary is still somewhat in doubt.

Fourteen farm sites were renovated during the year, bringing the total to 93.

A small gravel deposit was located in the northwest section of the refuge. We opened the pit and graveled about $\frac{1}{4}$ mile of service road before weather shut the job down.

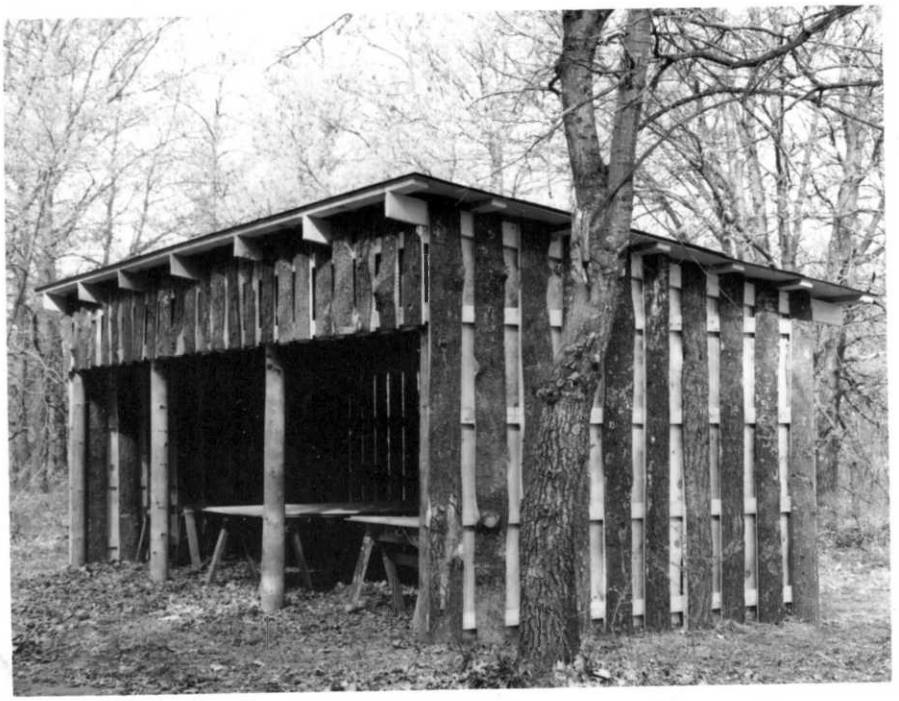
Utilizing old building sites and existing driveways, we developed seventeen parking areas throughout the Refuge. These were well accepted by the public and materially aided in reducing our problem of cross-country driving. Refuge effort involved placing signs at the limit of vehicle travel and mowing the areas.

Approximately ten miles of old woods roads were brushed out and

either mowed or disced and seeded to clover for hunter walking trails. We received several favorable comments on this project and had surprisingly little problems with vehicle trespass.

The need developed for some type of shelter for environmental education groups. Using pole construction, with sawmill slabs for sidewalls, we came up with a rather interesting 10 X 30' building. Total cost about $200.00.

While it was not a major job, we had requests for benches along the wildlife trail. We used eight foot logs, 18-20" diameter, sawed in half. It took four men with pole carriers to set them, but they don't look bad, require no upkeep and stay in place.



Environmental Education shelter

New Equipment

The following items of new equipment were obtained during the year:

1. 7' Rome disc, which is well matched to the 4000 Ford tractor.
2. 7' Mott flail mower
3. Model 12 motor grader - thanks to Ft. Leonard Wood surplus and the Mingo Refuge staff.
4. Two mobile radio units

B. Plantings

1. Aquatics and Marsh Plants None.

2. Trees And Shrubs None.

3. Upland Herbaceous Plants Native grass seeding continues with 106 acres completed this year. The total now stands at 313 acres. The seed misture on a P.L.S. basis, consisted of Big Bluestem 20%, Indiangrass 20%, Little Bluestem 20%, Switchgrass 20%, Green needlegrass 10% and Blue Gramma 10%. Seeding rate was approximately seven pounds P.L.S. per acre. A twenty acre tract of quackgrass was burned on June 5 and seeded June 8. It is too early for an evaluation of this method of seed bed preparation, but it does look encouraging, particularly on thin stands of quack.

4. Cultivated Crops Eleven permittees contracted for 1,785 acres of cropland in 1970. Hot, dry weather in the late spring and summer damaged legume seedings and prevented some rye and red clover from being seeded. Contracts were completed on 1,623 acres, with this breakdown:

Corn	724 acres
Harvested rye	316 acres
Seeded rye	285 acres
Red or alsike clover	224 acres
Alfalfa	36 acres
Sweet clover	12 acres
Silage sorghum	20 acres
Dwarf milo	6 acres

In addition to providing maintenance fertilization and herbicide (atrazine), permittees applied 200 tons of lime and 2400 pounds of 0-0-60.

The basic share agreement is 25% of the corn for the refuge. Increased shares were arranged individually with those permittees applying lime or potash.

Corn yields ranged from good-60+ bushels-to poor with an average of about 40 bushels. Rye made 16 to 18 bushels.

The sorghum was used as seed bed preparation for native grass seeding. It was harvested leaving a high stubble for wind protection. Grass

will be seeded in the stubble in 1971. We will know in a year or two how successful this method is.

Red clover, seeded in 1969, made a fair crop of hay on about half the acreage. Success in obtaining a stand seeded to depend more on weather than on seeding method. The fields that got a couple of good showers, made it. The others didn't.

It is generally agreed that the size of the farming operation at Sherburne is considerably larger than wildlife needs dictate. Through permanent or semi-permanent grass and legume seedings we plan to reduce this acreage to a more realistic level.

Refuge personnel seeded 25 acres of sweet clover and 20 acres of Elban rye. Elban may not be winter-hardy this far north. It froze back quite severely in the early winter.

We seeded 70 acres of Japanese millet and ten acres each of proso, foxtail millet and buckwheat. The seedbed was worked twice with a Rome disc, seed was broadcast, and soil compacted with a corrugated packer. The first seeding was on June 9, the last June 30. All made good to excellent crops. As in the past, waterfowl use of this food will depend on spring flooding.

C. Collection and Receipts

None

D. Control of Vegetation

Atrazine, at a rate of 1-2 pounds/acre, was applied by cooperators to most corn land for quack grass (Agropyron repens) control.

Four acres of leafy spurge (Euphorbia esula) and two acres of Canada thistle (Cirsium arvense) were treated with Boralin(Picloram) beads, $\frac{1}{2}$ pound picloram/acre. Control seems to be excellent.

Approximately 50 acres of low land was cut twice with our Rome disc for brush control. Results were not completely satisfactory. The seven foot disc is too light to handle the amount of grassy vegetation involved. Burning alone or burning prior to discing seems the best solution with our present equipment.

E. Planned Burning

Two controlled burns were conducted this year.

The first consisted of 20 acres of moderate to heavy quack grass, burned on June 5, prior to seeding native grass. Seeding was done June 8 and 9. The quack grass greened up again in about 10 days, but produced only 3-4 inches of top growth the rest of the season. The natives seemed to do extremely well. Some seedlings were 1-2 inches, in height by fall, which is quite unusual, at least in this area. We will try to burn this field again next spring if there is enough dry material to carry the fire.

The second burn involved approximately 80 acres of white top, blue joint,and cordgrass meadow. This area is adjacent to the winter holding pen for the captive goose flock. The objective here was to remove the waist high grass and provide an open area for migrant geese, also to controll willow, which was encroaching on the area. Three separate burns were made on August 8, August 11 and August 27. Weather conditions were favorable and a good burn was obtained each time. All top growth appeared killed on the willow, but it started to sucker out from the roots three weeks after burning.

On the two early burns the grass recovered to a height of 6-8 inches, and was killed back by frost the third week in October. However on the late burn, regrowth was only 3-4 inches and this remained green till late November, when the temperature fell to -5°. It is possible that the larger amount of "black" area on this burn retained enough heat from the sun to hold off frost for a period of time. At any rate, the late burn provided available green vegetation for an additional four weeks.

Considering the small number of migrant geese presently using the refuge, this burn probably had the most extensive goose use on the area. A flock of 75 Blue and snow geese rested here briefly, and 40 Canada's used the area for both resting and grazing over a six week period.

F. Fire

None

IV. RESOURCE MANAGEMENT

A. Grazing

One permit for intermittent grazing on four acres - $10.00.

B. Haying

Four permits were issued for harvesting 77 acres of alfalfa. Hay was cut after July 25, for a fee of $1.00/acre. Three permittees harvested 55 acres of red clover hay as part of their farming contract.

C. Fur Harvest

The Sherburne Refuge was again open to trapping for mink and muskrat only. Twenty special use permits were issued to trappers at no charge. This year trappers were asked to report their catch at the conclusion of the trapping season. The following animals were reported as being taken during 1970:

Muskrat	436
Mink	88
Raccoon	11 (released)
Weasel	1
Beaver	0
	536

D. Timber Removal

Four tracts of Christmas trees were put up for bids this fall. One permittee purchased 1,595 red pine, black, white and Colorado blue spruce for $2500.00. Mr. Bob Johnson, Area Forester, completed a Forest Management Plan for the Sherburne National Wildlife Refuge which will be of considerable help in our Master Planning efforts.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Progress Report - Indian Mound Excavations

Professor Richard B. Lane and his students from St. Cloud State College continued their work on the Indian mounds during the summer of 1970. The following report on the current progress of this work was extracted from a paper prepared by Professor Lane and presented to the Minnesota Academy of Science at the Sherburne Refuge on September 27, 1970.

OUTLINE OF REFUGE SITE PREHISTORY

Richard B. Lane
Ass't Prof. of Anthropology
Dept. of Sociology & Anthropology
St. Cloud State College

The Site Area

The Refuge Site is located on United States Department of the Interior lands in the Sherburne National Wildlife Refuge near Princeton. The areas of most intensive past human activity on the site are in the NE $\frac{1}{4}$ of Section 27, the NW $\frac{1}{4}$ of Section 26, and the NW $\frac{1}{4}$ of Section 35 -- all in Township 35 North, Range 27 West of Sherburne County, Minnesota.

The primary classes of cultural evidence which have so far been located consist of two major groups of burial mounds and approximately four areas of human village activity debris, generally conform to the 960 foot elevation contour around Rice Lake. This contour, which appears as a low ridge at some distance from the present lake shore, is apparently the result of a long period of diminution in the water level of the lake. Rice Lake itself, now both fed and drained by the St. Francis River, was probably formed as the result of an ice block basin in a glacial outwash plain sometime between 9000 and 6000 B.C.

Although the limits of the site, in terms of space, time, and cultural form have not yet been completely determined, some 42 mounds with three areas of probable village activity have been located on the northern shores of Rice Lake, while 18 mounds and one large area of probable village activity have been located to the southeast of the lake. Test excavations in both areas have indicated a fairly long occupation of the Refuge Site area.

Chronological Outline

Although Rice Lake was formed sometime between 9000 and 6000 B.C., no evidence of human occupation in the area dates back this far. The first definite cultural evidence at the site (in the form of projectile points and stone tools) dates to about 2500 B.C. From this time on, however, the site area seems to be continually inhabited. The archaeological cultures known to be present at the site are briefly outlined below.

Late Archaic (ca. 3000 - 1000 B.C.) -- This cultural/developmental period is characterized by a well developed regional adaptation to the environment. There are small populations, seasonal camping sites, and a relatively low level of social organization. Hunting and gathering is the basis of the subsistence economy. The people of the period did not build mounds and did not have pottery.

Woodland (ca. 1000 B.C. - A.D. 100) -- This cultural/developmental period, subdivided by some archaeologists into an Early, Middle, and Late Woodland, is characterized by the development of agriculture, mound building, pottery making, and a general increase in technological sophistication in many areas. In the central Minnesota area, wild rice becomes an important item in the subsistence economy. Larger populations develop, with more stable residence. Permanent villages and mortuary monuments are common. (The majority of mounds and village areas at the Refuge Site belong in this Woodland category.)

Mississippian (ca. A.D. 1000 - 1700) -- This cultural/developmental period is characterized by new pottery types, a different style of mound building, increased dependence on plants (although hunting is still important to subsistence), larger populations and villages and, probably as a function of all these things, a much more developed social organization. In the latter part of this period, sometimes called the "protohistoric period", the historically known tribes of the area develop. (A few of the mounds and one of the village activity areas at the Refuge site are considered Mississippian. -- One small area of village activity, seemingly more recent than any other so far located, has been tentatively identified as being a camp site of a group of Santee Sioux, and would date between 1500 to 1600.)

Excavation at the Refuge Site

Working under federal antiquities act permits granted by the United States Department of the Interior, St. Cloud State College students under my direction have been conducting test excavations at the Refuge Site during the summer months of 1969 and 1970. A total of six mounds and two areas of village activity have been examined, with the general results outlined above.

Due to the size of the site, the quantity of material present, and the importance of the information to be gained, at least two more seasons of excavations are planned. It is hoped that both extensive and intensive excavations can be combined with a program of interpretive on-site reconstruction of selected portions of the site. Materials collected from the past and planned excavations will eventually be displayed both on the Sherburne National Wildlife Refuge and at St. Cloud State College.

B. Progress Report - Captive Giant Canada Goose Flock

We began the year 1970 with 270 giant Canada geese on the refuge. Out of 31 mated pairs, 25 nested in the 50' X 50' breeding pens, and the first egg was laid on April 8. We gathered a total of 188 eggs from first clutches and sent 142 eggs to three locations in Minnesota and South Dakota for incubation. The remaining 46 eggs were given to the Nebraska Game and Parks Commission. Of the 142 eggs incubated, only 51 or about 36% hatched. We can only guess at the reasons for the poor hatching success since it was impossible to keep track of the outcome of individual clutches. Of the 25 pairs that laid a first clutch, 13 re-nested and hatched 50 young. Total production for the year amounted to 101 goslings. In view of the increased cost and labor of gathering and transporting eggs and the low hatching success of incubated eggs last year, this phase of the rearing program will not be included in 1971. Mated pairs of geese will be placed in the breeding pens and allowed to nest, hatch their eggs and raise the young from their first clutch.

The proposed study involving the Sherburne as the summer area and the Clarence Cannon Refuge as the wintering areas was re-evaluated and rejected. Of the 102 birds taken to Clarence Cannon last fall only 28 survived. These were picked up and brought back to the Refuge this summer. Current plans call for releasing about 20 pairs of Giant Canada geese on the Sherburne just prior to the nesting season this spring. This will be our first release of geese on the refuge since the flock was started. We are somewhat ahead of ourselves, since more geese will be available for release during the next few years than we have habitat to support them. Several marshes and shallow lakes on the refuge are large enough to support geese, however, other essentials appear to be lacking. There are no natural islands for nesting sites and the heavy cattail border on most marshes has nearly eliminated loafing areas and may act as a barrier to brood movements. At any rate we should all learn something from our first release this spring.

C. Environmental Education

Although this is only our second year of active participation in the Environmental Education program, we feel that the groundwork has been established for a rapid expansion in the coming year. Karen Jostad and Ed Landin, staff members at the Golden Valley Environmental Science Center visited the refuge several times again this year and co-ordinated three Environmental Education workshops this fall. Refuge and Fish Hatchery Managers and representatives from Washington, D.C. and the Regional Office attended the workshops held on May 14-15, October 15-16, and October 22-23. Each was accompanied by a high school teacher from his local area. All of the representatives participated in each of the field studies and then observed a group of students conducting the same procedures. At the conclusion of the field work, informal discussions were held and it was apparent that there was considerable enthusiasm and interest in the program. Ed and Karen did an excellent job of co-ordinating the workshops and we applaud their efforts.

Many contacts were made with schools in the Central Minnesota area concerning Environmental Education. We are rapidly coming to the conclusion that bus tours and slide talks take a back seat to getting the kids out in the woods for a closer look at where the action is.

VI. PUBLIC RELATIONS

A. Recreational Uses

Public use continued to increase again this year. We had an estimated 32,013 visitors this year as compared to 25,390 in 1969 for an increase of about 26%. This was not surprising since we received

considerable publicity through a variety of news media. Manager Bob Yoder was featured in a hunting special shown on September 27 on WTCN-TV Minneapolis. The Sherburne Refuge was also featured on several radio programs and in newspaper articles throughout the year. We estimate that our public use will increase at the rate of about 30% each year until development is in progress or near completion. The population of the area is growing rapidly and there has been a substantial increase in the demand for recreation, particularly in the area of winter sports.

This summer, several miles of primitive roads and old wagon trails were mowed, disced, closed to vehicle trail and set aside as walking trails for hunters, hikers and other nature enthusiasts. This may have been the year that we finally got the idea across to the visiting public that vehicle travel is not permitted over the entire refuge. In the past cross-country travel by car to a fishing hole, deer stand, etc. was the rule rather than the exception.

Many new signs have been added including a four-color entrance sign at the Wildlife Trail. We also did some "landscaping" along the trail this year. Several aspen, red pine, ash and oak were transplanted along the entrance to the trail using a "tree transplanter" on loan from the Hennepin County Parks Department. Our thanks to Mr. Robley Hunt for loaning us this amazing piece of equipment.

Our captive goose flock and display area continues to be one of the biggest attractions at the Refuge. This aspect of the Sherburne has been heavily publicized and draws large numbers of people from far and near. One thing is clear at this point - a large number of people are expecting big things from us in the way of giant Canada geese. Activities within a few miles of the refuge boundary have also had a profound effect on our public use. Completion of the Jellystone Park Campgrounds a few miles off the west boundary has drawn large numbers of people into the area, many of which visited the refuge this summer and early fall. Other private campgrounds and resorts in Sherburne County are doing a booming business and serve as a reservoir of refuge visitors.

Many guided tours were provided for organized groups and in many cases have stimulated return visits and favorable comments. Some of the more noteworthy groups visiting Sherburne included the Minnesota Academy of Science, Regional Meeting of the Society of American Foresters, Soil Conservation Service personnel and Area Game Managers from 13 Minnesota counties, and many elementary and high school groups from the state.

B. Refuge Visitors

The listing of individual Refuge visitors during the year has reached a point of being extremely time consuming and of doubtful importance to any one reading this report or as a historical reference for the Refuge staff. A few of the more significant visitors during the year were as follows:

Date	Name & Organization	Purpose
1/26	Roger Grosslien, MCD, St. Paul	Tour
	Ervin Belland, MCD, St. Paul	"
	Earl Putzke, MCD, St. Paul	"
3/17	Sidney Rommel, MCD, Div. Lands & Forestry	Land Exchange
3/20	John Pallansch, MCD	Orientation
	David F. Dunn, Dir. Olmsted Co. Park & Rec.	" "
6/11	Dr. John M. Bernard, Ithaca, New York	Est. Research Project
	Dr. Evelle Gorham, Botany, U. of Minn.	" " "
6/13	Commissioner Meacham, Washington, C.O.	Tour
7/7	Dr. Wm. Green, Upper Miss. F&WL Refuge	Goose Management
9/1	WTCN Film Crew, Twin Cities, Minn.	TV Film
9/1	Howard Shepperd, MCD	Tour
9/21	Arnie Sandager, Area Ext. Coord., St. Paul-Nat. Resources Wkshop	
10/9	Dr. Breckenridge, Minn. Historical Museum	View Gyrfalcon

Approximately 2000 or more persons visited the Refuge Headquarters during the year, the majority during the summer months, and none are really considered insignificant. Even the six year old in desperate need of bathroom facilities or the den-mother looking for directions in a pouring rain with seven excited cub scouts is a potential conservationist. The reception at the refuge could affect their attitude towards "conservation" or Refuges for years to come. We hope that all those that have visited the Refuge during the past year have left with a feeling of sincere welcome and will wish to return again in the future.

It also should be mentioned that there were many visits to the Refuge by personnel of the Minnesota State Conservation Department and from our Regional Office in Minneapolis. Their importance is recognized, but are not itemized for lack of space.

C. Refuge Participation

A total of fourteen talks or slide-talks were given during the year by Refuge personnel with approximately 850 in attendance. Refuge personnel also assisted the Minnesota Conservation Department with Snowmobile Training on safety during the winter months.

The Refuge Manager worked with the Central Minnesota Council, Boy Scouts of America at St. Cloud on Project "SOAR". In March the BSF&W film, "So Little Time" was shown to the 1500 students of the Princeton Schools.

In September Refuge personnel assisted in a Conservation Education Workshop for 700 students at St. Cloud.

D. Hunting

1. Waterfowl The Minnesota waterfowl season this year ran from October 3 to November 16. With the liberalized bag limits and predictions for a good fall flight, most hunters expected excellent hunting. It turned out to be one of the poorest duck seasons in several years.

At Noon on opening day, shallow marshes on the Refuge were virtually dry due to lack of rainfall during the late summer. Most of the ducks and hunters concentrated on the permanent water areas. On October 3 there were about 700 hunters distributed over 1,010 acres of river, lake and deep marshes. Each hunter then had about one and one-half acres to himself on the average. This was even less if you take into account the restriction on open-water shooting in Minnesota.

Within three hours of the noon opening, about 2,000 ducks had moved into Long Pond, the only closed area on the refuge which contained any appreciable amount of water. This area held birds throughout the hunting season and provided limited shooting during the evening feeding flights to Little Rice Lake west of Princeton, Minnesota.

"Success" on opening weekend averaged 1.4 birds per hunter for 92 hunters checked. The kill was predominantly coots, mallards, teal, woodducks and pintails in that order. After opening weekend, the ducks were gone except for Long Pond. Hunting pressure fell off drastically and consisted of "ground raking" coots and blasting refuge signs and woodduck boxes. Many reports indicated that later flights of ducks and geese passed over east-central Minnesota on their way south and few northern birds were seen after the first week in October.

Until land acquisition is completed and additional areas are closed to hunting, duck and goose use on the Sherburne NWR in the fall will continue at a low level. There is no way that ducks, geese, whistling swans, sandhill cranes and other marsh birds-will utilize the refuge in the fall in any numbers unless the excessive hunting pressure is curtailed. Recently, there has been concern in our

evaluation of public use on refuges about "conflicts" between various refuge activities. Presently, there is a conflict between waterfowl hunting and wildlife observation during the fall months. Hunters burn the ducks and geese out of the refuge on opening weekend and from then on it is a rarity to observe any waterfowl until spring.

2. Upland Game Ruffed Grouse Season opened this year on September 26 and the first season closed on November 8. It re-opened for a two-week late season beginning on November 16. Hunting pressure on grouse was considerably heavier this year due in part to the lack of ducks and the much restricted deer season. Grouse probably served as a buffer for many people who normally hunted ducks and deer. Hunter success throughout the season was fair to good. Few limits were taken but most hunters had one or two birds and often reported flushing several. Early in the season the birds were less wary and easier to flush, but difficult to hit through the leaves. During the second season, hunter visibility in the woods improved after leaf fall, but the birds began flushing wild. All in all, grouse hunting provided more quality sport for a greater number of hunters than all other forms of hunting combined.

3. Big Game A one-day, shot-gun only, deer season was held on November 14 in east-central Minnesota to include the Sherburne NWR. About 200 hunters killed an estimated 20 white-tailed deer. This was about half the hunters we had last year and about half as many deer were taken this year as compared to 1969. Several bow-hunters were active on the refuge this year, but no deer were taken that we know of.

E. Violations

Four cases for refuge violations were handled through local court as follows:

Name	Address	Charge	Disposition
Christensen, Allen	Minneapolis, Minn.	Late shooting	$10/4 costs
Laitinen, Dudley	Robbinsdale, Minn.	Late Shooting	$10/4 costs
		Unplugged gun	$15/4 costs
Neuman, Donald	Zimmerman, Minn.	No license Unplugged gun	$40/8 costs
Urban, Rodney	Minneapolis, Minn.	Late shooting	$50/4 costs
		deer	deer confiscated

State Game Wardens Wayne Forsythe and Richard Simmons assisted in the disposition of these cases and their cooperation was most appreciated.

F. Safety

SAFETY meetings with films and color slides were held throughout the year. Mr. Lyle Miller, Regional Safety Officer, visited the Refuge on August 25, 1970 to inspect refuge equipment and facilities. There were no accidents during the year and no resulting lost time occurred. The station record is now 1,893 days without a lost-time accident.

Two new brush guards were installed on our two crawler tractors and the brush guard/roll bar on our wheeled-tractor was remodeled.

VII. OTHER ITEMS

A. Items of Interest

1. Personnel Manager Bob Yoder, Soil Conservationist Homer McCollum, and Maintenancemen Wes Thompson, Hank Trebesch and Reuben Mathison attended the Game-Law Enforcement Workshop held at Jamestown, North Dakota from April 27 to May 1, 1970

Manager Yoder participated in the Systems Analysis Training Program at Minneapolis, Minnesota on August 17 and 18.

Soil Conservationist McCollum was TDY from August 10 to September 23 in a liaison capacity for the Extension Program at the Horicon National Wildlife Refuge.

On June 22, 1970 Bob Drieslein joined the staff at Sherburne as Assistant Refuge Manager. Bob was recently discharged from the U.S. Marine Corps, is married (wife Vicky) and has one son (Rob). He received a B.S. degree at the University of Illinois in 1964 and an M.S. degree at South Dakota State University in 1966.

2. Acquisition By the end of 1969, approximately 22,400 acres of land within the proposed refuge boundary have been purchased. This year an additional 36 tracts comprising about 2700 acres were added to the total refuge acreage which now stands at about 25,100. The remainder includes 1680 acres of state land and 4,292 acres of private land. At this time the refuge is about 86% purchased. Recently, a trade was negotiated with the State of Minnesota for three public accesses to lakes on the refuge. Our realty branch is also negotiating a trade between Federal land located elsewhere in Minnesota and State Wildlife Management Areas within the refuge boundary. Some difficulty has been encountered with State Forest Lands in the southeast corner of the refuge. The refuge in this area is bounded on three sides by the Sand Dunes State Forest and the State of Minnesota will only accept land in exchange which is contiguous with the current State Forest boundary. The outcome here is still in doubt but it appears likely that the present refuge boundary will be changed to facilitate a workable exhange of State and Federal lands.

SHERBURNE NATIONAL WILDLIFE REFUGE

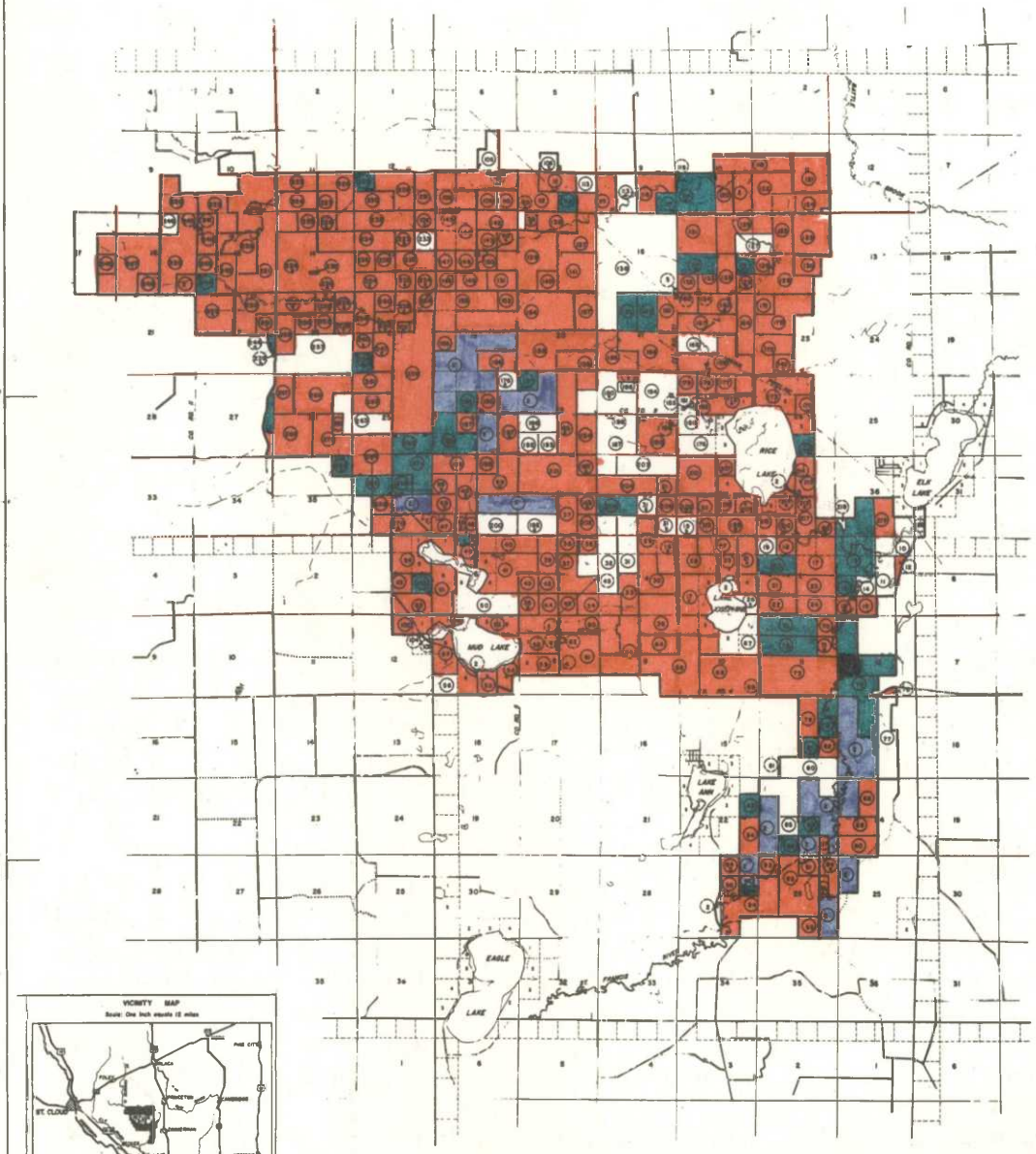
SHERBURNE COUNTY, MINNESOTA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

93° 50' R. 28 W. R. 27 W. 93° 40' R. 27 W. R. 26 W.

45° 35'
T. 36 N.
T. 35 N.
45° 30'
T. 35 N.
T. 34 N.
45° 25'
T. 34 N.
T. 33 N.



Land optioned prior to 1970

Land optioned in 1970

State Land

93° 50' R. 28 W. R. 27 W. 93° 40' R. 27 W. R. 26 W.

COMPILED IN THE BRANCH OF ENGINEERING
FROM AERIAL PHOTOGRAPHS AND SURVEYS
BY THE U.S.G.S.

MINNEAPOLIS, MINNESOTA JAN, 1963

FOURTH PRINCIPAL MERIDIAN

Scale CHAINS MILES

TOWNSHIP DIAGRAM

MEAN DECLINATION 1960

3. Credits and Photographs This year's narrative was a cooperative effort between our Soil Conservationist Homer McCollum who wrote Section III and most of Sections I and IV, our clerk-typist, Pat Dunham who summarized the weather data, compiled the visitor list and refuge participation, and of course typed it all, and Assistant Manager, Bob Drieslein who wrote Sections II, V, VII and most of Section VI. Manager Bob Yoder escaped the Narrative this year but found the formulation of Refuge objectives to be an equally challenging task.

SIGNATURE PAGE

Submitted by:

Robert G. Yoder
(Signature)
Robert G. Yoder

Refuge Manager
(Title)

Date: MAR 9 1971

APPROVED, Regional Office:

James B. Monroe
(Signature)
ASST

Regional Refuge Supervisor

3-1459
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Sherburne NWR

MONTHS OF January TO April, 19 70

(1) Species	Weeks of reporting period (2)									
	1	2	3	4	Apr 4 — 5	Apr 11 — 6	Apr 18 — 7	Apr 25 — 8	May 2 — 9	May 9 — 10
Swans:										
Whistling					2					
Trumpeter										
Geese:										
Canada						35	90	25		
Cackling										
Brant										
White-fronted										
Snow										
Blue										2
Other										
Ducks:										
Mallard						1200	2000	2200	1400	450
Black						30	30	25	10	
Gadwall						25	25			
Baldpate						75	150	25	20	
Pintail						200	200	300	100	25
Green-winged teal						30	75	150	80	25
Blue-winged teal						25	900	1700	1200	800
Cinnamon teal										
Shoveler						25	100	125	90	50
Wood						25	25	25	25	25
Redhead								20	10	10
Ring-necked						300	300	790	200	150
Canvasback								20	10	10
Scaup						700	1000	1890	390	200
Goldeneye						30	25			
Bufflehead						30	25			
Ruddy								25	10	
Other							2	4		
Coot:							200	500		200

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Co NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE [redacted] MONTHS OF January TO April, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard											
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	14	2	
Geese	770	30	
Ducks	140,547	7,210	
Coots	6,300	300	

SUMMARY

Principal feeding areas Rice Lake, Mud Lake, Lake Josephine, Bergin Slough and Johnson Slough

Principal nesting areas Rice Lake, Mud Lake, Lake Josephine, Bergin Slough and Johnson Slough

Reported by Robert G. Ryder, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1750
Form N[illegible]-1
(Rev. [illegible]rch 1953)

WATERFOWL

REFUGE Sherburne NWR MONTHS OF May 1 TO Aug. 31, 19 70

(1) Species	Weeks of reporting period (2)									
	May 2 1	May 9 2	May 16 3	May 23 4	May 30 5	June 6 6	June 13 7	June 20 8	June 27 9	July 4 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	1400	450	350	300	250	250	250	250	250	250
Black	10					2				
Gadwall					10					
Baldpate	20									
Pintail	100	25	25							
Green-winged teal	80	25	50	75	75	75	75	75	75	75
Blue-winged teal	1200	800	500	300	275	275	275	275	275	275
Cinnamon teal										
Shoveler	90	50	25							
Wood	25	25	100	200	250	250	250	250	250	250
Redhead	10	10				12				
Ring-necked	200	150	50	10	4					
Canvasback	10	10								
Scaup	350	200	50							
Goldeneye										
Bufflehead										
Ruddy	10	10								
Other										
Coot:		200	25	10	10	10	10	10	10	10

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(Rev. March 1953)

WATER OWL
(Continuation Sheet)

REFUGE Sherburne NWR MONTHS OF May 1 TO August 31, 19 70

(1) Species	(2) Weeks of reporting period: July 11 (11)	July 18 (12)	July 25 (13)	Aug 1 (14)	Aug 8 (15)	Aug 15 (16)	August 22 (17)	Aug 29 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	250	250	250	300	375	400	400	450	46,725	8	114
Black									94		
Gadwall									70		
Baldpate								20	140		
Pintail									1190		
Green-winged teal	75	75	75	75	100	100	125	125	10,010	3	56
Blue-winged teal	275	275	275	400	600	1600	1200	1300	72,625	10	162
Cinnamon teal									2,052		
Shoveler									1,399		
Wood	250	250	250	300	300	350	450	500	31,500	9	116
Redhead									224		
Ring-necked							25		3,073		
Canvasback									140		
Scaup									4,200		
Goldeneye											
Bufflehead									140		
Ruddy											
Other											
Coots:											
	10	10	10	10	10	10	50	150	3,955		448

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0	0	0
Geese	0	0	0
Ducks	175,231	3,505	448
Coots	3,955	200	10

SUMMARY

Principal feeding areas Orrock Lake, Rice Lake, Johnson & Durgin Slough

Principal nesting areas Fields bordering marshes along Co. Rd. # 5, Long Pond & Turnbull slough

Reported by Robert L. Drieslein, Ass't Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

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1953

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Sherburne

MONTHS OF September 9 TO November 4, 1970

(1) Species	(2) Weeks of reporting period: Sept 9-11	Sept 10-12	Sept 23-13	Sept 30-14	Oct 7-15	Oct 14-16	Oct 21-17	Oct 28-18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling							20				
Trumpeter											
Geese:											
Canada					57	35	50	30			
Cackling											
Brant											
White-fronted											
Snow						75	20				
Blue											
Other											
Ducks:											
Mallard	328	400	500	650	948	3200	2340	1000			
Black											
Gadwall							20				
Baldpate	16		100		1380		70				
Pintail	7			50	102	80	60				
Green-winged teal	17	200	300	200	408						
Blue-winged teal	1136	2500	3000	2000	1440	100					
Cinnamon teal											
Shoveler	5										
Wood	355	200	150	75	87	25	5	5			
Redhead											
Ring-necked		50	90	175	197	300	480	20			
Canvasback					6						
Scaup							10				
Goldeneye											
Bufflehead											
Ruddy					10						
Other	30										
Coot:	156	1000	20,000	20,000	25,000	15,000	5000	1000			

(over)

3 -1750a

Co NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Sherburne MONTHS OF November TO December 31, 1970

(1) Species	(2) Weeks of reporting period: Nov 4 – 11	Nov 11 – 12	Nov 25 – 13	Dec 2 – 14	Dec 9 – 15	Dec 16 – 16	Dec 23 – 17	Dec 31 – 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimat total
Swans:											
Whistling		25							59		
Trumpeter											
Geese:											
Canada	40	40	40						2044		
Cackling											
Brant											
White-fronted											
Snow									117		
Blue											
Other											
Ducks:											
Mallard	500	200							68,366		
Black	2								14		
Gadwall									140		
Baldpate									10,850		
Pintail									1,484		
Green-winged teal									6,356		
Blue-winged teal									62,580		
Cinnamon teal											
Shoveler											
Wood	5								3,830		
Redhead									70		
Ring-necked	10								9,240		
Canvasback									42		
Scaup									70		
Goldeneye											
Bufflehead											
Ruddy									70		
Other											
Coot:	200	50							610,750		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	61	20	
Geese	2,150	50	
Ducks	438,274	7,220	
Coots	611,005	25,000	

SUMMARY

Principal feeding areas **Orrock Lake, Rice Lake, Johnson & Durgin Slough**

Principal nesting areas **Marsh borders along county road # 5, Turnbull slough, Orrock Lake**

Reported by **Robert L. Drieklein**

Assistant Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-.
(Nov. 1945)

MIGRATO BIRDS
(other than waterfowl)

Refuge Sherburne NWR Months of January to April 195X 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common loon	2	4/18	6	4/20						10
Red necked grebe	2	5/24	4	5/24	2	5/24				10
Eared grebe	50	4/17	100	4/20	1	5/2				150
horned grebe	1	4/20	10	4/20	1	4/20				50
Pied-billed grebe	1	4/14	75	4/25						100
Great Blue heron	4	3/31	20	4/10						20
Green heron	1	4/14	50	5/1						100
Common Egret	1	4/14	4	5/1						10
Black crowned night heron	4	4/24	25	5/10						
American bittern	1	5/9	75	5/20						150
Sand hill crane	1	5/1	2							2
Sora rail	2	4/25	1000	5/10						1500
Virginia rail *	2	4/25	900	5/10						1000
II. Shorebirds, Gulls and Terns:										
American woodcock	1	4/20	500	5/1						1000
Common snipe	15	4/14	1500	4/25						2500
Greater Yellowlegs	10	4/26	150	5/10						200
Lesser yellowlegs	4	4/23	75	5/10						150
Dowitcher *	2	5/2	4	5/2	2	5/2				10
Wilson's phalarope	2	4/26	10	5/3	2	4/26				20
Herring gull	6	4/14	20	5/2						
Ring Billed Gull	1	4/20	20	5/2						
Common Tern	14	4/20	75	5/20						
Black tern	20	5/22	200	5/25						

*First official sighting on Refuge

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	2	1/15	1000	6/1					
White-winged dove									
IV. Predaceous Birds:									
Golden eagle	1	3/21	1	3-21	1	3/21			
Duck hawk									
Horned owl	Resident		75	6/1					
Magpie									
Raven									
Crow	Resident		150	6/1					
Turkey vulture	6	4/11	10	4/15					
Red-tailed hawk	4	4/2	75	4/10					
Red shouldered hawk	1	4/14	25	4/20					
Rough-legged hawk	2	4/4	20	4/10					
Marsh Hawk	4	4/10	10	4/20					
Sparrow Hawk	1	4/13	75	4/20					
Loggerhead shrike	1	4/14	50	4/20					

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1...
(Nov. 1945)

MIGRATO... BIRDS
(other than waterfowl)

Refuge Sherburne Months of May 1 to August 31 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon	2	4-18	5	6-20	1	8-26		1	2	5
Red necked grebe	2	6-15	2	6-15	1	7-29		1		2
Pied billed grebe	1	4-14	100	6-25					60	100
Great Blue heron	1	4-9	60	7-10						60
American bittern	1	5-9	75	5-20						90
Least Bittern	2	7-13	4	7-16						5
Green heron	1	4-14	125	7-5					80	150
American coot	1	6-10	5000	9-12						6000
Sora	2	4-25	1000	5-10						1000
Virginia rail	1	7-10	1	7-10	1	7-10				1
Sandhill crane	1	5-1	3	9-2						5
Common egret	1	6-11	1	9-3	1	9-3				2
II. Shorebirds, Gulls and Terns:										
Black tern	20	5-22	500	7-10	3	8-26			400	600
Killdeer	1	4-6	200	7-10					120	200
Spotted Sandpiper	1	6-15	50	7-10						50
Greater Yellow legs) Lesser Yellowlegs)	14	4-25	225	5-10						225
Woodcock	1	4-20	150	7-5						200
Common snipe	15	4-14	250	7-5	7	8-26				300

(over)

(1)	(2)		(3)		(4)	(5)		(6)
III. Doves and Pigeons:								
Mourning dove	2	1-15	1500	7-15		800	1000	1500
White-winged dove								
IV. Predaceous Birds:								
Golden eagle								
Duck hawk								
Horned owl	Resident		10	6/1				10
Magpie								
Raven								
Crow	Resident							
Sparrow hawk	10	6-1	150	8-1				150
Redtailed hawk	4	4-2	15	7-15				25
Marsh hawk	1	4-3	8	7-15				10
Redshouldered hawk	1	4-14	3	7-1				3
Cooper's hawk	2	8-1	4	8-15				4
Sharpshinned hawk	3	9-1	12	9-15				12

Reported by R.L. Drieslein

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) ,tal: Estimated total number of the speci using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-
(Nov. 1945)

MIGRAT(BIRDS
(other than waterfowl)

Refuge Sherburne Months of January 1 to December 31 195X70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon	2	4-18	5	6-20	1	8-26		1	2	5
Red-necked grebe	2	5-25	4	5-25	1	7-29		1	2	4
*Eared grebe	50	4-17	100	4-20	1	5-2				150
Horned grebe	1	4-20	10	4-20	1	4-20				50
Pied-billed grebe	1	4-14	100	6-25	1	10-29		U	U	100
Great blue heron	4	3-31	50	7-10	1	10-6		U	U	60
American bittern	1	5-9	75	5-20	1	9-5		U	U	75
Green heron	1	4-14	125	7-5	1	9-16		U	U	150
Least bittern	2	7-13	4	7-16	1	7-28		U	U	10
Common egret	1	4-14	4	5-1	1	9-2				10
Black-crowned night heron	4	4-24	25	5-10	25	5-10				30
Sandhill crane	1	5-1	2							2
Sora	2	4-25	1500	6-10	2	9-24		U	U	
*Virginia Rail	2	4-25	500	5-10	1	7-10		U	U	500
II. Shorebirds. Gulls and Terns:										
American woodcock	1	4-20	500	5-1	1	10-28				500
Common snipe	15	4-14	1500	4-25	1	10-28				1500
Greater Yellowlegs	10	4-26	150	5-10	1	9-27				200
Lesser yellowlegs	4	4-23	75	5-10	1	9-27				150
*Dowitcher	2	5-2	5	5-2	2	5-2				10
Spotted sandpiper	1	5-15	50	7-10	1	7-10				50
Wilson's phalarope	2	4-26	10	5-3	2	5-26				20
Herring gull	6	4-14	20	5-2	1	10-2				25
Ring-billed gull	1	4-20	20	5-2	1	10-2				30
Common tern	14	4-20	75	5-20	75	5-20				100
Black tern	20	5-22	200	5-25	20	8-25				500
Killdeer	1	4-6	300	7-10	1	9-23				600

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	2	1-15	1500	7-15	1	10-29		
White-winged dove								
Loggerhead shrike	1	4-14	50	4-20	1	11-19		
IV. Predaceous Birds:								
Golden eagle	1	3-21	2	11-10	2	11-10		
Duck hawk								
Horned owl	Resident		50	6-1				
Magpie								
Raven								
Crow	Resident		150	6-1				
Turkey vulture	6	4-11	10	4-15	10	4-15		
Red-tailed hawk	4	4-2	50	4-10				
Red-shouldered hawk	1	4-14	25	4-20	1	7-1		
Rough-legged hawk	2	4-4	20	4-10	1	11-25		
Coopers hawk	2	8-1	7	8-15	1	11-21		
Sharp-shinned hawk	3	9-1	12	9-15	1	10-6		
Sparrow hawk	1	4-13	75	4-20	1	10-15		
Gyrfalcon(dark phase)	1	10-5	1	10-5	1	10-5		

Reported by Robert L. Drieslein

*First record of this species for the Sherburne NWR.

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the speci using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Sherburne — For 12-month period ending August 31, 1970

Reported by R.L. Dresslein — Title Assistant Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3) Use-days	(4) Breeding Population	(5) Production
1	Crops	2,186.4	Ducks 40,060	150	201
	Upland	4,380.7	Geese 2,450		
	Marsh	3,373.7	Swans 4		
	Water		Coots		
	Total	9,940.8	Total 42,514	150	201
2	Crops	834.7	Ducks 11,620	61	57
	Upland	1,252.0	Geese		
	Marsh	1,095.9	Swans		
	Water	17.9	Coots		
	Total	3,201.5	Total 11,620	61	57
3	Crops	706.6	Ducks 26,300	60	72
	Upland	3,063.4	Geese		
	Marsh	2,192.6	Swans		
	Water	215.7	Coots 420,000		
	Total	6,174.3	Total 446,300	60	72
4	Crops	903.8	Ducks 24,580	50	55
	Upland	2,104.4	Geese		
	Marsh	1,444.4	Swans		
	Water	250.8	Coots 210,000		
	Total	4,703.8	Total 234,580	50	55
5	Crops	556.5	Ducks 4,760	12	20
	Upland	1,436.2	Geese		
	Marsh	482.9	Swans		
	Water		Coots		
	Total	2,475.6	Total 4,760	12	20
6	Crops	554.0	Ducks 6,944	42	45
	Upland	2,243.0	Geese		
	Marsh	1,214.7	Swans		
	Water	12.2	Coots		
	Total	4,023.9	Total 6,944	42	45
Total	Crops	5,022	Ducks 114,272	385	450
	Upland	14,707	Geese 2,450		
	Marsh	9,797	Swans		
	Water	496	Coots		
	Total	30,022	Total 630,000	385	450

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form MR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Sherburne NWR Months of January 1 to April , 1970

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ruffed Grouse	Upland, bottom land, timber, scrub, swamp 9,115 acres	10	15	100	50:50	400	0	0	1,000	
Ring-necked pheasant	Grassland, reverting agricultural lands, marshes & fields 8,280 acres	300	0	20	50:50	0	0	0	25	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Sherburne NWR Months of April to August, 1970

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ruffed grouse	Upland, bottomland, timber, scrub, swamp 9,115 acres	5	25	800	50:50	400	0	0	2,000	
Ringnecked pheasant	Grassland, agricultural lands, marshes & fields 8,280 acres	336	1	20	50:50	20	0	0	25	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge **Sherburne** Months of **September 1** to **December 31 =**, 19**70**

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ruffed grouse	**Upland, bottomland timber, scrub & swamp 9,115 acres**	**10**			**50:50**	**500**	**-**	**-**	**1400**	
Ring-necked pheasant	**Grassland, reverting agricultural land, marshes & fields 8,280 acres**	**336**			**50:50**					

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1773
Form AR-3
(June 1945)

BIG GAME

Refuge Sherburne Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed deer	Cropland 5,822 Upland 14,787 Marsh 9,797	U	20				2	U	U			250	200	U

Remarks:

Reported by Robert L. Drieslein, Ass't Ref. Mgr.

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Sherburne NWR Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Muskrat	Marsh, River, ponds 4,638	10		100										500
Mink	" " " 11,356	75		50										150
Beaver	" " " 3,008	60		20										50
Raccoon	" " " 19,368	65												300
Cotton Tail Rabbit	Field & meadows 8,136	80												100
White-tailed Jackrabbit	" " 8,136	55												150
Gray Squirrel	Hard woods 8,57[illegible]	1	600											8,000

* List removals by Predator Animal Hunter

REMARKS:

Reported by E. H. McCollum

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-175[illegible]
Form [illegible]-5
60701

DISEA[illegible]

Refuge Sherburne Year 19 70

Botulism None this year

Lead Poisoning or other Disease None

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected

Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

-1757
orm NR-,
Rev. June 1960)

NONAGRICULTURAL COLLECTIO' RECEIPTS, AND PLANTINGS (1)

Refuge **Sherburne** Year 19**70**

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
Blue gramma	**80 lb.**	**R**	**4-70**	**Commercial**	**100**	**50**	**12 areas, S&W**						
Big bluestem	**50 lb.**	**R**	**4-70**		**77**	**200**	**portions of**						
Green needle-grass	**90 lb.**	**R**	**4-70**		**60**	**30**	**Refuge**	**Mixture 7 lb./A**	**106**		**May-June**	**Good**	
Switchgrass	**240 lb.**	**R**	**4-70**		**87**	**150**							
Indiangrass	**120 lb.**	**R**	**4-70**		**125**	**100**							
Little bluestem	**-**	**-**	**-**	**-**	**-**	**150**	**-**	**-**			**-**	**-**	

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

'otal acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

3-1758
Form NR-6
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge **Sherburne** County **Sherburne** State **Minnesota**

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Corn	579	23,000	7	300	148	5,600	724	COVER	
Rye(harvested)	316	5,400					316	sweet clover	37
Rye(seeded)					285	285 T	285	native grass mixture	106
Red or Alsike clover					224	100 T	224	Browse	
Dwarf milo	5.5	170			.5	20	6	Rye	285
Silage sorgum	20	60T					20	Alfalfa	36
Alfalfa					36	18 T	36		
Japanese millet					70	2800	70		
Proso millet			2	60	8	240	10		
Foxtail millet			2	40	8	200	10		
Buckwheat					10	300	10		
								Fallow Ag. Land	35

No. of Permittees: Agricultural Operations 11 Haying Operations 7 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	150	77	$77.00	1. Cattle	6-intermittent		$10	4
Red clover	75	55	-	2. Other				
				1. Total Refuge Acreage Under Cultivation				1,711
Hay - Wild				2. Acreage Cultivated as Service Operation				144

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Sherburne — Months of January through December, 1970

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Yellow corn	700	300	1000			500	500	500		500	
Japanese millet		50	50		50		50	-			
Proso millet		65	65		5	10	15	50		50	
Foxtail millet	5	40	45		5	10	15	30		30	
Buckwheat		10	10		10		10	-			
Elbon rye		25	25		25		25	-			
Sweet clover		3	3		3		3	-			
Mammoth red clover		1	1		1		1	-			

(8) Indicate shipping or collection points Princeton, Minnesota

(9) Grain is stored at Refuge granary

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1761
Form NR
(2/46)

TIMBEl EMOVAL

Refuge Sherburne NWR Year 19~~X~~70

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Nan Conifer Co.	1	McNamara Tract(28)	35	3064 NorwayPine 3046 Scotch Pine	20¢/tree 35¢/tree	612.80 1066.10	cutting to take place thru 1970, clear cut Scotch pine & leave 100 Norway pine per acre,	Norway Pine Scotch Pine Xmas trees
Nelson's Tree Farms	2	Pergerson (43) Olaffson (179) Berlin(82) Berlin(266) Mason(259)	152	816 trees	25¢/tree	206.50	Same as above	Norway Pine Scotch Pine Xmas trees
Leonard Latterell	16	Tekar(159a)	27	965 Spruce		1750.00	cutting to be completed by 1971.	Blue,Black & White Spruce
	17	Skoog(71)		630 NorwayPine		800.00		Norway Pine

Total acreage cut over 214 Total income $4,435.40

No. of units removed B. F. Method of slash disposal

Cords

Ties

8,521 Christmas Trees

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: **Sherburne NWR**

Proposal Number:

Reporting Year: **1970**

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May-June	Quack Grass	All Farm Units	700	AAtrex	700 lb.	1 lb./Acre	Water 25 gal/ Acre	Tractor sprayer
July	Leafy Spurge Canada Thistle	8 small areas	6	Picloram	12 lb.	.5 lb/Acre	Beads	Broadcast

10. Summary of results (continue on reverse side, if necessary)

AAtrex is supplied by cooperative farmers as part of contract agreement. Treatment does not eliminate quack grass, but gives adequate control for corn production.

Picloram appears to give excellent control of both spurge and thistle.

35500

An immature, dark-phase gyrfalcon, crippled by a hunter and found on the refuge on November 12, 1970.

About 15% of the refuge nesting boxes were used by wood ducks during 1970.

Out on a limb - - without the limb.

Looking north along the dike.

Maintenanceman Wes Thompson adding fill to a dike constructed at the Schuette tract this summer. The dike was built across a drainage ditch and will impound about 50 acres of water during high water in the spring.

Walking the dragline during dike construction at the Schuette tract.

Looking south along the dike. Peat borrow areas are at the flanks of the dike. Sand for the core of the dike was scraped from a borrow area just beyond the woodlot in the background.

Part of a pothole-island complex constructed with a drag-line this summer. This area is included in the basin of a proposed future impoundment.

In the absence of ducks and their wives, many hunters are inclined to vent their frustrations on wood duck nesting boxes.

Who would waste money fertilizing weeds? These photos were taken on June 19, about 20 yards apart. The area in the lower picture received 100 pounds per acre of 33-0-0 on May 11. Vegetation is quack grass.

Working ground with a Rome disc.

Seeding in late June.--

--and packing

produced Japanese millet like this by late September.

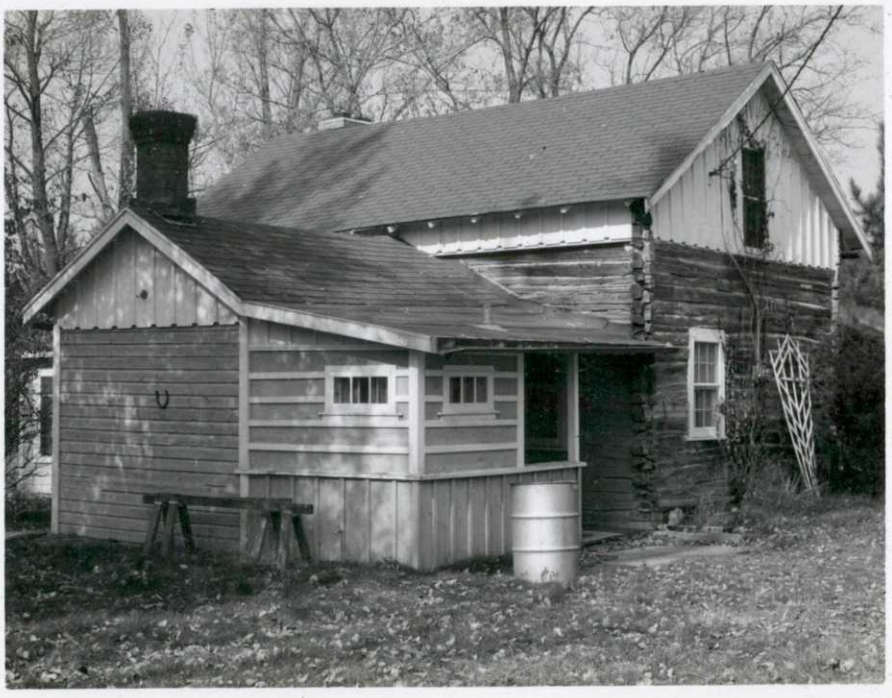
Removing a culvert and beefing up the dam, resulted in a nice five acre pond.

The first brood of ducks seen this spring was here, on May 23. The pond was developed by closing a drainage ditch.

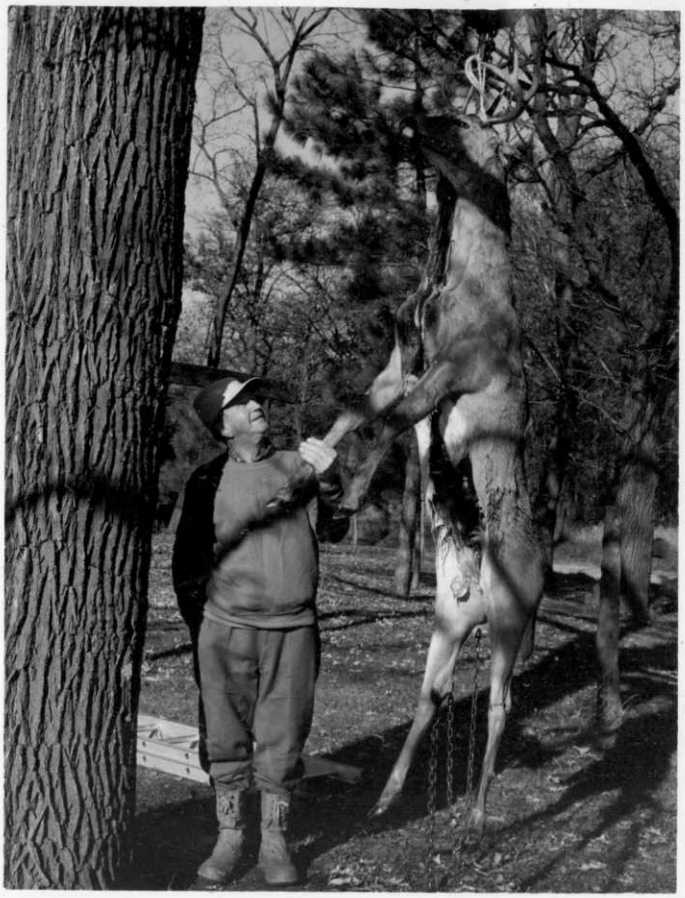
This one required a slide gate on a road culvert and 3 short dams. Distance from the plane to the river bridge(left center) is about one mile.

Big bluestem and other native prairie grasses continue to invade areas removed from cultivation.

Our sign shop at Winona really outdid themselves with this one.



This partly renovated log cabin, built in 1860, is being used as a residence for summer employees. Many of the original logs still remain in good condition.



This nice buck was one of 17 deer taken during the one-day, slug-only season this year at Sherburne.

E.H. McCollum scores on a big carp at Rice Lake. Bow-hunting for rough fish is becoming increasingly popular and in our opinion fills the bill as "quality" recreation.

A dog-racing club from the Anoka area used the refuge again this year as a training ground.